

INFRASTRUCTURE PLANNING TOOL

A School Bus Fleet's Guide to Successful Electric Bus Charging

Going Electric

Are you a school bus fleet that is considering going electric? Start here! Children are the future, which is why we need modern transportation solutions to keep our youth healthy while taking them to school. Switching to electric can be easy with the right steps, this tool will help you get started by providing guidance on the planning required to implement electric charging at your bus depot.

Infrastructure First

For electrifying a school bus fleet, infrastructure remains to be the biggest barrier to technology adoption. Infrastructure challenges such as deployment lead time, costly upgrades, space constraints, and demand charges are impacting a fleet's ability to effectively own and operate an electric school bus fleet. By following this guide, you will learn the basics of how to anticipate scaling needs, build out your depot, and engage with your utility so that your charging infrastructure matches your fleet's needs.

Important Considerations to Infrastructure Deployment

A number of unknowns will need to be evaluated to best determine your electric bus fleet deployment plan.

Anticipate scaling needs

Though a school bus fleet may initially demonstrate just a few electric buses to determine fleet and operational suitability, it is critical to anticipate potential scaling needs. Your fleet could grow from 10 to 100 electric buses sooner than you think.

Infrastructure costs can vary

Depending on fleet size, bus technology, charging equipment, access to the grid and power demand, infrastructure costs can vary with factors such as required utility upgrades, trenching and laying down conduit, and additional energy storage.

Work with your utility

Working with your utility from the onset of the planning process is critical to understand potential build out requirements, cost and development timelines.

Evaluate electric vehicle rates and potential demand charges

Working with your utility to evaluate electric vehicle rates and potential demand charges is important to avoiding high charging costs while operating an electric bus fleet.

STEPS TO GET STARTED

1

CONSIDERATION OF ELECTRIC BUS DEPLOYMENT

- Engage your utility and identify needed technical support.
- Confirm charging requirements, bus duty cycles, and projected energy needs.
- Determine fleet scaling potential.
- Communicate early plans with local utility.
- Plan for phasing and timeline for deployment.

2

DEPOT YARD ANALYSIS

- Evaluate site infrastructure and utility grid infrastructure needs.
- Identify service drop and transformer locations.
- Identify space availability.
- Evaluate charging/renewable energy options.
- Identify charger type (AC or DC/Level 2 or 3).

3

DEVELOPMENT OF ELECTRIC SERVICE PLAN

- Detail requested service voltage and load schedule.
- Develop conceptual electric single line diagram.
- Determine costs for infrastructure requirements & development.

4

CONSTRUCTING DEPOT CHARGING INFRASTRUCTURE

- Engage prime contractor to begin work.
- Work with contractor to meet permitting requirements.
- Ensure delivery of electric buses matches lead-time for construction.

5

ELECTRIC SERVICE PLAN

- Detail requested service voltage and load schedule.
- Identify service drop and transformer locations.
- Develop conceptual electric single line diagram.
- Determine costs for design, site works and installation.

6

BEGIN INSTALLATION PROCESS

Considerations with Utilities

- Evaluate microgrids, energy storage, vehicle-to-grid opportunities, & smart charging software.
- Evaluate existing infrastructure incentive programs.
- Determine EV rate structure.
- Learn about Vehicle-to-Grid Incentives.
- Plan charging times.
- Evaluate load sharing options.

Deployment Timeline

It is important that you factor in the time it will take to plan, develop and deploy your electric charging infrastructure. Full deployment can take up to 1 – 4 years based on fleet size and needed upgrades. The timeline below is based on deployment best practices.

PLANNING:

Steps 1- 5
3 – 12 Months

DEVELOPMENT:

Electric Upgrades & Construction
6 – 48 Months

DEPLOYMENT:

Integrating Electric Buses
1 - 3 Months



Infrastructure Planning Check List

Before you get started with planning your electric charging infrastructure, make sure you are prepared to know the following and soon, you'll be ready to go!

- Fleet Deployment Goals
- Project Team (Internal & External)
- Utility Point of Contact
- Estimated Project Timeline
- Capital Budget for Project
- Understanding of Contracting Process
- Available Battery Electric Bus Technologies
- Electric Vehicle Supply Equipment Options
- Smart Charging Software & Networking
- Available Incentive Programs
- Permitting Requirements



Contact CALSTART for
infrastructure planning assistance!
www.calstart.org

